I HEREBY CERTIFY THAT THIS CORRESPONDENCE IS BEING DEPOSITED WITH THE UNITED STATES POSTAL SERVICE AS FIRST CLASS MAIL IN AN ENVELOPE ADDRESSED TO: MAIL STOP APPEAL BRIEF - PATENTS, COMMISSIONER FOR PATENTS, P.O. BOX 1450, ALEXANDRIA, VA 22313-1450, ON THE DATE INDICATED BELOW.

AF/S
IFW

BY: Iris C. Ramsey Date: 10/10/06

MAIL STOP APPEAL BRIEF - PATENTS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of: Michael J. Pollack			
Conf. No.:	3856	Group Art Unit:	2621
Appln. No.:	10/058,658	Examiner:	Richard J. Lee
Filing Date:	January 28, 2002	Attorney Docket No.:	P0515-2U1

Title: MONITORING SYSTEM FOR HOSTILE ENVIRONMENT

APPEAL BRIEF TRANSMITTAL LETTER

The following are enclosed:

[X]	Appellant's Brief Under 37 C.F.R. § 41.37;	
[ ]	A Petition for Extension of time for @% months with requisite fee;	
[X]	A check in the amount of $250 to cover the appeal brief filing fee under 37 C.F.R. 41.20(b)(2).	
[X]	The Commissioner is hereby authorized to charge Deposit Account No. 50-3541 (Billing No. P0515.0003) as noted below. An additional copy is enclosed.	
	[ ]	Appellant's Brief fee in the amount of $_____.
	[X]	Any deficiencies or overpayments in the above-calculated fee.

Respectfully submitted,

MICHAEL J. POLLACK

October 10, 2006 By: _____
(Date)

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BY: Lisa C. Ramsey Date: 10/18/06

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APPEAL BRIEF

TABLE OF CONTENTS

TABLE OF AUTHORITIES

I. REAL PARTY IN INTEREST

This application is assigned to Pollack Laboratories, Inc. by an Assignment recorded on February 15, 2006 at Reel 017164, Frame 0821. Accordingly, Pollack Laboratories, Inc. is the real party in interest.

II. RELATED APPEALS AND INTERFERENCES

Appellant, his assignees, and their legal representatives are unaware of any related appeals or interferences.

III. STATUS OF CLAIMS

Claims 1-31 are pending in this application. In a Final Office Action mailed April 4, 2006, all claims were rejected under 35 U.S.C. § 103(a) on the grounds discussed below.

Claims 1-31 are appealed. The claims are set forth in the Claims Appendix.

IV. STATUS OF AMENDMENTS

All amendments have been entered.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The present invention relates to a monitoring system for monitoring hostile environments or a sealed chamber, such as the system shown in Fig. 1, reference numeral 10 below. In particular, the system is used for transmitting images from and/or monitoring or measuring parameters within a sealed chamber, such as a semiconductor processing chamber 100 (specification page 2, lines 5-7, page 5, lines 30-32, and page 13, lines 4-7). Oftentimes, it is desirable to view or monitor the conditions within sealed chambers and/or hostile environments such as the environments present within semiconductor wafer processing chambers. Typically, however, the conditions within such chambers preclude the use of standard, unprotected sensing or monitoring equipment and techniques (specification page 5, lines 10-21). The monitoring system of the present invention as claimed in claims 1-31 overcomes this problem by providing a system for monitoring one or more parameters and/or transmitting images from within such

sealed chambers and/or hostile environments (specification page 2, lines 5-7 and page 5, lines 25-29).

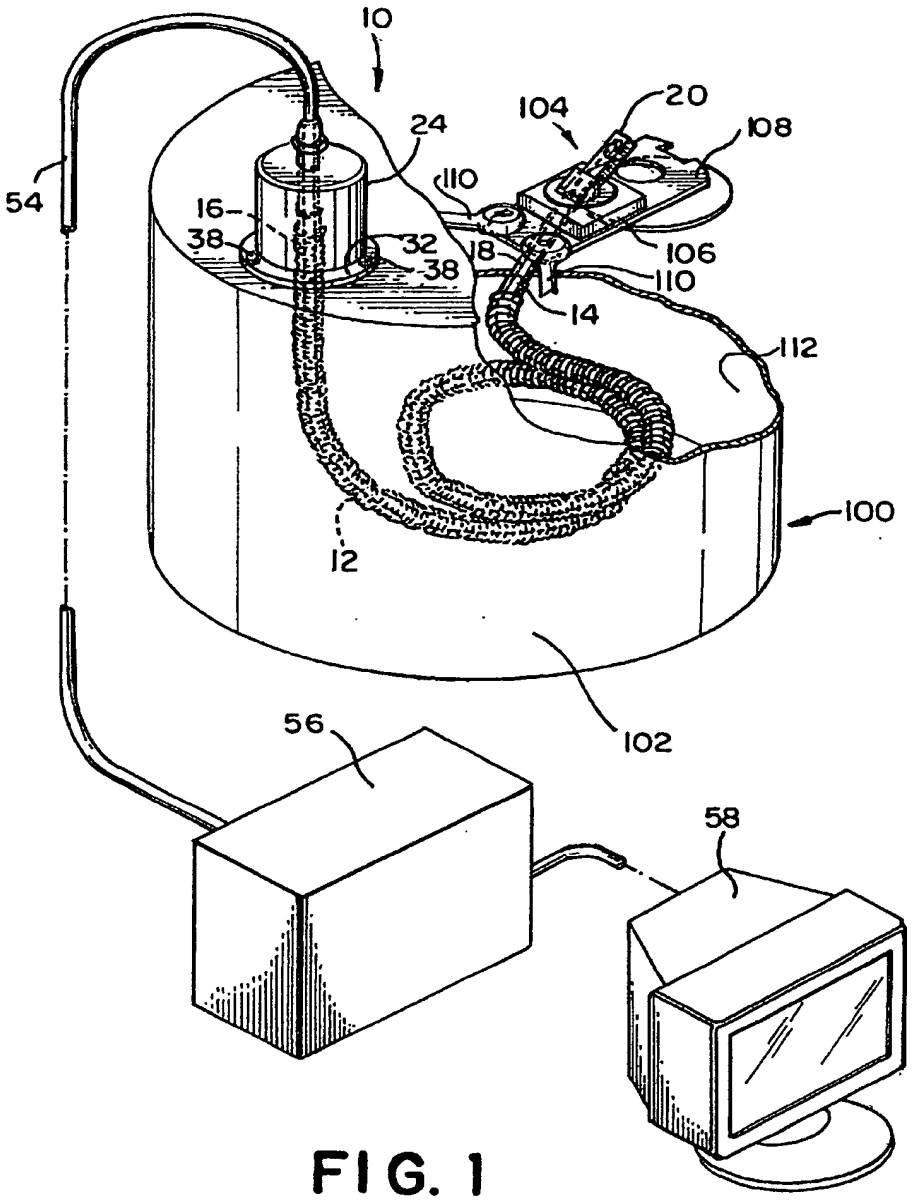

FIG. 1

Figure 1. FIG. 1 of U.S. Patent Application No. 10/058,658.

As claimed, the optical monitoring system includes a generally tubular, elongated, hermetically sealed protective housing 12 having a distal end 14 and a proximal end 16, which housing is flexible in claims 1, 9, 17, and 23 and claims dependent thereto and optionally flexible in claims 30 and 31. The protective housing 12 is made of a non-porous material, such as, but

not limited to, stainless steel, for instance (specification page 6, lines 1-8). In claims 1, 9, 17, 23, and dependent claims thereto, the non-porous material is corrosion-resistant. A sealed window 22 is at the distal end 14 of the housing 12 (specification page 7, lines 1-2). The proximal end 16 of the housing 12 is rigidly secured to the chamber wall 102 at the access port 114 to form a hermetic seal between the proximal end 16 of the housing 12 an the chamber 100 (specification page 9, lines 7-20). The interior of the housing 12 is accessible through the access port 114. In claims 1, 9, 23, 30, 31 and dependent claims thereto, the interior of the housing 12 includes a transmission media, for example, one or more electrical wires or fiber optic bundles for monitoring optical images (specification page 10, lines 7-10 and 24-27). Optical images obtained from the interior 112 of the chamber 100 through the window 22 or output signals are transmitted to a monitor 58 or apparatus (specification page 10, lines 22-31).

In claims 2, 11, and 25 the monitoring system is as noted for independent claims 1, 9, and 23 respectively and further specifies the housing having a flexible sheath formed of a stainless steel bellows for making the housing generally flexible, non-porous, and corrosive resistant (specification page 6, lines 3-8).

In claims 3, 12, and 26 the monitoring system is as noted for independent claims 1, 9, and 23 respectively and further specifies the housing having a flexible polymeric tube for making the housing generally flexible, non-porous, and corrosive resistant (specification page 6, lines 3-11).

In claim 6 the monitoring system is as noted above for independent claim 1 and further specifies the housing having a viewing end which is aligned with the sealed window (specification page 10, lines 19-21).

In claim 7 the monitoring system is as noted above for independent claim 1 and further specifies transmission media comprised of a coherent fiber optic bundle (specification page 10, lines 24-27).

In claims 8, 16, and 29 the monitoring system is as noted for independent claims 1, 9, and 23 respectively and further specifies that the housing is provided with a fluid under pressure to control the environment within the interior of the housing (specification page 12, line 26 through page 13, line 3).

In claim 9 and the claims dependent thereto, the monitoring system is as noted above and further specifies a camera for recording images of the interior of the chamber through the window (specification page 11, lines 1-14).

In claim 15 the monitoring system is as noted above for independent claim 9 and further specifies that the camera is an infrared camera (specification page 11, lines 1-3).

In claim 17 and the claims dependent thereto, the monitoring system is as noted above, but the interior of the housing includes a flexible borescope for sensing or obtaining images within the interior of a sealed chamber (specification page 10, lines 15-24).

In claim 18 the monitoring system is as noted above for independent claim 17 and further specifies the housing having a flexible sheath formed of a stainless steel bellows for making the housing generally flexible, non-porous, and corrosive resistant (specification page 6, lines 3-8).

In claim 19 the monitoring system is as noted above for independent claim 17 and further specifies the housing having a flexible polymeric tube for making the housing generally flexible, non-porous, and corrosive resistant (specification page 6, lines 3-11).

In claim 20 the monitoring system is as noted above for independent claim 17 and further specifies that the window is formed from a material which is resistant to hostile environments and has high light transmission such as synthetic sapphire, glass, quartz or a polymeric material (specification page 7, lines 5-7).

In claim 21 the monitoring system is as noted above for independent claim 17 and further specifies that the window is secured to the housing such that a gas tight connection is formed by methods such as brazing, fusion, or an adhesive (specification page 7, lines 7-12).

In claim 22 the monitoring system is as noted above for independent claim 17 and further specifies that the housing is provided with a fluid under pressure to control the environment within the interior of the housing (specification page 12, line 26 through page 13, line 3).

In claims 23, 31, and the claims dependent thereto, the housing includes a sensor for sensing a parameter of the hostile environment through the window 22 (specification page 9, lines 29-31 and page 10, lines 5-7). Otherwise transmission media transmit an output signal of

the sensor to an apparatus located outside of the chamber 100. The apparatus receives and processes the sensor signal. As claimed in claim 23 and the dependent claims, the apparatus further displays a representation of the sensor signal (specification page 10, lines 7-14).

In claim 24 the monitoring system is as noted above for independent claim 23 and further specifies that the sensor is a temperature sensor, a pressure senor, an oxygen sensor, or a spectra graphic chemical analysis sensor for measuring various parameters within the interior of a sealed chamber (specification page 9, line 31 through page 10, line 5).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. Are claims 1, 4, 5, 9, 10, 13, 14, 23, 27, 28, 30, and 31 patentable under 35 U.S.C. § 103(a) over U.S. Patent No. 5,956,077 to Qureshi *et al.* ("Qureshi") in view of U.S. Patent No. 6,111,599 to Nance *et al.* ("Nance") and U.S. Patent No. 5,993,902 to Heid?

B. Are claims 2, 11, and 25 patentable under 35 U.S.C. § 103(a) over Qureshi, Nance, and Heid as applied to claims 1, 4, 5, 9, 10, 13, 14, 23, 27, 28, 30, and 31, and further in view of U.S. Patent No. 4,591,794 to Shattuck *et al.* ("Shattuck")?

C. Are claims 3, 12, and 26 patentable under 35 U.S.C. § 103(a) over Qureshi, Nance, and Heid as applied to claims 1, 4, 5, 9, 10, 13, 14, 23, 27, 28, 30, and 31, and further in view of U.S. Patent No. 4,540,258 to Chiodo?

D. Are claims 6, 7, 17, 20, and 21 patentable under 35 U.S.C. § 103(a) over Qureshi, Nance, and Heid as applied to claims 1, 4, 5, 9, 10, 13, 14, 23, 27, 28, 30, and 31, and further in view of U.S. Patent No. 3,778,170 to Howell *et al.* ("Howell")?

E. Are claims 8, 15, 16, 24, and 29 patentable under 35 U.S.C. § 103(a) over Qureshi, Nance, and Heid as applied to claims 1, 4, 5, 9, 10, 13, 14, 23, 27, 28, 30, and 31, and further in view of U.S. Patent Publication No. 2002/0116987 to Braithwaite *et al.* ("Braithwaite")?

F. Is claim 18 patentable under 35 U.S.C. § 103(a) over Qureshi, Nance, Heid, and Howell as applied to claims 1, 4-7, 9, 10, 13, 14, 17, 20, 21, 23, 27, 28, 30, and 31, and further in view of Shattuck?

G. Is claim 19 patentable under 35 U.S.C. § 103(a) over Qureshi, Nance, Heid, and Howell as applied to claims 1, 4-7, 9, 10, 13, 14, 17, 20, 21, 23, 27, 28, 30, and 31, and further in view of Chiodo?

H. Is claim 22 patentable under 35 U.S.C. § 103(a) over Qureshi, Nance, Heid, and Howell as applied to claims 1, 4-7, 9, 10, 13, 14, 17, 20, 21, 23, 27, 28, 30, and 31, and further in view of Braithwaite?

VII. ARGUMENT

A. INTRODUCTION

The examiner has rejected all independent claims on no less than three prior art obviousness reference combinations and some dependent claims on the basis of five such prior art reference combinations. However, the prior art references cited neither establish a case of *prima facie* obviousness nor disclose or suggest the Appellant's invention.

To establish a case of *prima facie* obviousness, the examiner must establish 1) some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings, 2) a reasonable expectation of success, and 3) that the combined references teach or suggest all the claim limitations. M.P.E.P. § 2142 (*citing In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991)).

For background, before presenting the specific rejection arguments below, and for the Board's convenience, a short summary of the primary references involved in the obviousness rejection combinations is provided.

B. SUMMARY OF PRIMARY PRIOR ART REFERENCES

1. U.S. Patent No. 5,956,077 to Qureshi *et al.*

Qureshi is directed to an inspection method and apparatus for tanks (*i.e.*, railroad tank cars). As shown in Figure 2 below, the inspection apparatus includes a casing and an articulated arm that extends into the tank through a manway hole (*i.e.*, an opening at the top of the tank to allow personnel to enter the tank). The apparatus further includes a camera and laser measuring device connected to an end of the articulating arm for monitoring the interior of the tank. In operation, the end of the articulating arm is inserted into the tank via the manway hole while the casing is coupled to the manway hole. The articulating arm then moves about the interior of the tank to monitor various parameters. After inspection of the tank, the apparatus is removed from the tank and used to inspect another tank. In sum, the inspection apparatus is a portable monitoring system used to inspect multiple railroad tank cars.

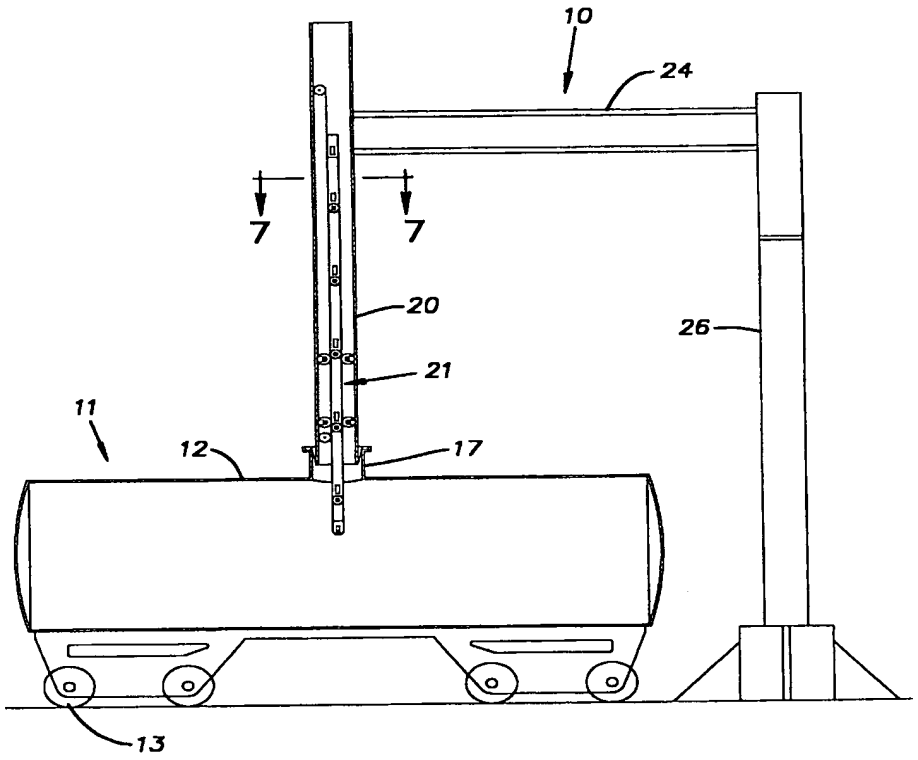

Fig. 1

Figure 2. Fig. 1 of U.S. Patent No. 5,956,077 to Qureshi *et al.*

2. U.S. Patent No. 6,111,599 to Nance *et al.*

Nance is directed to an apparatus for observing a hostile environment. The apparatus, includes a hermetically sealed, double walled chamber configured like a test tube 1 with an opening at one end and a camera disposed inside the test tube-like structure 1. In operation, the apparatus is used to observe Defense Waste Processing Facilities. Specifically, the apparatus is used to observe the flow of molten G glass generated by these facilities as it flows down a pour spout D. The open end of the test tube structure 1 is positioned outside the pour spout apparatus P such that the hostile environment created by the molten glass does not enter the test tube structure 1 (*see* Figure 3 below).

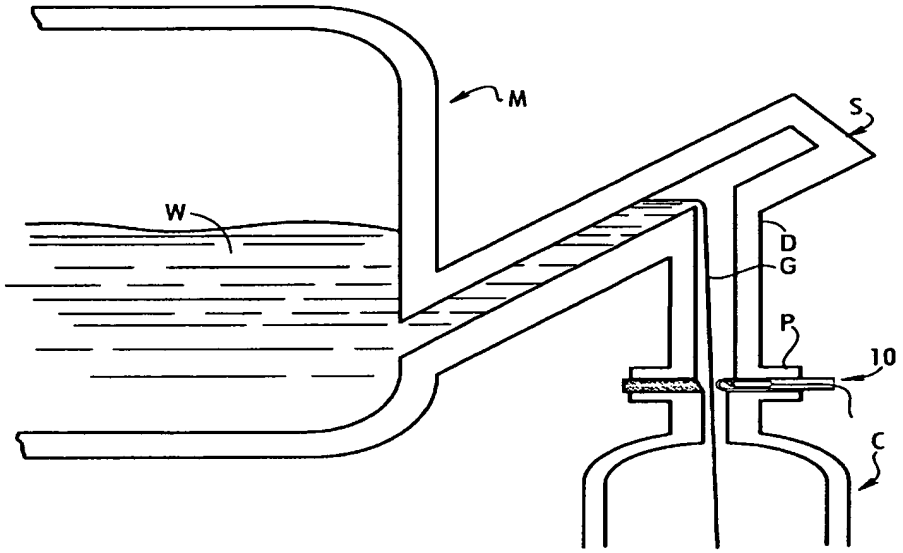

FIG. 1

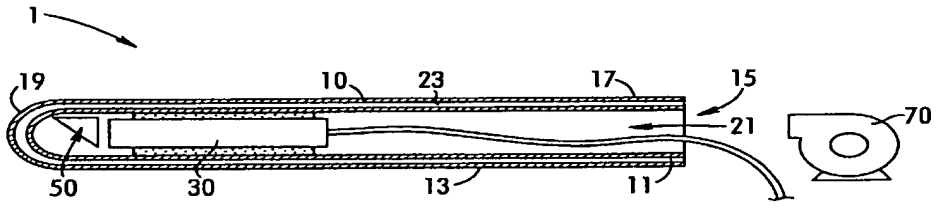

FIG. 2

Figure 3. Figs. 1 and 2 of U.S. Patent No. 6,111,599 to Nance *et al.*

3. U.S. Patent No. 5,993,902 to Heid

Heid is directed to an apparatus and method for extending the lifetime of an exhaust sleeve for growing silicon crystals by the Czochralski (Cz) method. Heid discloses a furnace 12 for manufacturing Cz crystals that has a camera 50 located on the top of the furnace 12, as shown in Figure 4 below.

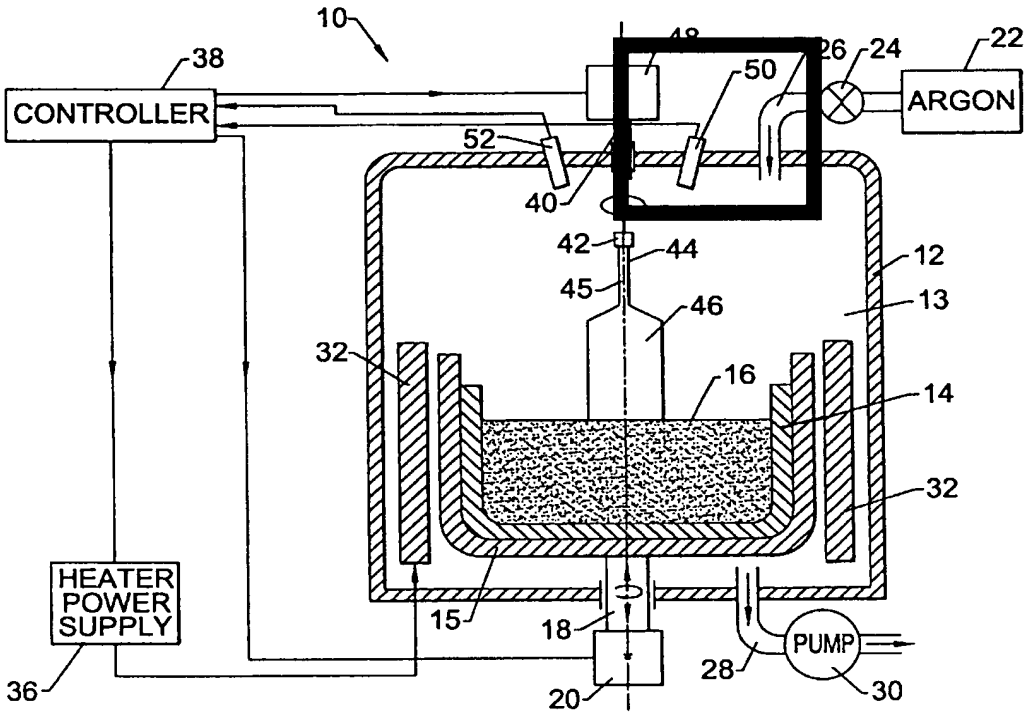

Figure 4. U.S. Patent No. 5,993,90 to Heid (bold black box added).

C. THE CITED REFERENCES DO NOT DISCLOSE OR SUGGEST THE CLAIMED INVENTION

Appellant in this section comments particularly on features not present in the primary combination references, which comments will particularly apply to all rejection arguments.

The combination of Qureshi, Nance, and Heid does not teach or suggest each and every element of the Appellant's invention as set forth in all pending claims. In particular, the cited references do not disclose (i) a hermetically sealed housing, and (ii) a hermetic seal between the proximal end of the housing and the chamber, as claimed in independent claims 1, 9, 17, 23, 30, and 31.

Qureshi does not disclose (i) or (ii). The examiner has already conceded that Qureshi does not disclose (i) or (ii). *See* April 4, 2006 Office Action, page 3, lines 9-21 ("Qureshi et al does not particularly disclose, ... (a) a hermetically sealed housing ... (b) the proximal end of the housing being rigidly secured to the chamber wall at the access port to form a hermetic seal between the proximal end of the housing and the chamber....").

Nance fails to cure the deficiencies of Qureshi. As shown in Figure 3 above, Nance discloses a housing 10 formed in a shape of a test tube with an opening 15 at one end. The housing itself is formed from a hermetically sealed double walled chamber 23. A camera 30 is positioned within the housing 10 and not within the hermetically sealed chamber 23. Accordingly, Nance does not disclose a hermetically sealed housing of the claimed invention.

The examiner contends that the teaching of a hermetically sealed double walled chamber would render obvious the presently claimed hermetically sealed housing. However, the examiner has misinterpreted the distinction between the housing 10 and the chamber 23 of Nance. The housing 10 of Nance (and not the chamber 23) houses a camera. And as taught by Nance, the housing is not hermetically sealed. Thus, Nance does not teach or suggest a hermetically sealed housing of the Appellant's claimed invention which houses a transmission media or flexible borescope for transmitting images.

Heid fails to cure the deficiencies of Qureshi and Nance. As shown in Figure 4 above, Heid only discloses a furnace with a camera 50 "located on the top of the furnace" to supply data to a controller (Heid col. 3, lines 53-54). Notably, Heid does not contain any other discussion about the camera other than that it is located on the top of the furnace. Heid does not disclose or suggest that the camera is secured to the top, let alone hermetically sealed to the furnace. Moreover, Fig. 4 (the only figure illustrating the camera 50 in Heid) does not provide any additional assistance in determining how the camera is placed on the top of the furnace. All that is disclosed is a generic box. Accordingly, Heid does not disclose (i) a hermetically sealed housing or (ii) a hermetic seal between the proximal end of the housing and the chamber of the claimed invention formed by rigidly securing the proximal end of the housing to the chamber.

The examiner contends that based upon the teaching of Heid, one of ordinary skill in the art "would have no difficulty in providing the hermetic seal between the proximal end of the

housing and the chamber as taught by Heid as part of the modified system within Qureshi et al and Nance et al..." (April 4, 2006 Office Action, page 5, lines 2-4). In this instance, the examiner equates a camera on the top of the furnace to that of (ii) a hermetic seal between the proximal end of a housing and the chamber. However, as Heid neither teaches nor suggests a housing for the camera or hermetically sealing the housing for the camera to a chamber, Heid fails to cure the deficiencies of Qureshi and Nance.

Thus, for the forgoing reasons, the cited references do not disclose or suggest the above noted features of the claimed invention.

D. THE EXAMINER HAS FAILED TO ESTABLISH *PRIMA FACIE* OBVIOUSNESS OF CLAIMS 1, 4, 5, 9, 10, 13, 14, 23, 27, 28, 30, AND 31 UNDER 35 U.S.C. §103(a) OVER QURESHI IN VIEW OF NANCE AND HEID

The examiner has rejected claims 1, 4, 5, 9, 10, 13, 14, 23, 27, 28, 30, and 31 under 35 U.S.C. § 103(a) as being unpatentable over Qureshi in view of Nance and Heid.

The examiner contends that Qureshi discloses an inspection method and apparatus for tanks, and substantially the same optical monitoring system as claimed in claims 1, 4, 5, 9, 10, 13, 14, 23, 27, 28, 30, and 31 (April 4, 2006 Office Action page 2, line 11 through page 3, line 8). However, the examiner concedes that Qureshi does not disclose a hermetically sealed housing having a sealed window and a transmission media such as a video camera and/or a sensor for recording images and/or sensing parameters within the interior of the chamber through the window as claimed in claims 1, 4, 5, 9, 13, 14, 23, 27, 28, 30, and 31 (April 4, 2006 Office Action page 3, lines 9-18). The examiner further concedes that Qureshi does not disclose the proximal end of the housing being rigidly secured to the chamber wall at the access port to form a hermetic seal therebetween as claimed in claims 1, 9, 23, 30, and 31 (April 4, 2006 Office Action page 3, lines 19-21).

Further, the examiner contends that

> Nance et al discloses an apparatus for observing a hostile environment as shown in Figures 1 and 2 and teaches the conventional use of a hermetically sealed housing (i.e., 10 of Figure 2 and see column 4, lines 30-38) made of a non-porous, corrosive-resistant material, wherein the distal end of the housing

> including a sealed window (i.e., 11 or 13 of Figure 2 and see column 4, lines 12-38), wherein the window is formed from a material selected from the group consisting of synthetic sapphire, glass, quartz and a polymeric material, wherein the window is secured to the housing by a method selected from the group consisting of brazing, fusion, and an adhesive (see Figure 2 and column 4, lines 12-38), a video camera/sensor positioned to record images of the hostile environment/interior of the chamber through the window (see 11, 13, 30 of Figure 2 and column 4, lines 12-65), and transmitting images of the interior of the chamber obtained through the window from the distal end of the housing to the proximal end of the housing (see column 4, lines 12-65).

April 4, 2006 Office Action page 4, lines 1-12. The examiner also alleges that in light of the general knowledge of hermetically sealed housings with sealed windows associated with inspecting chambers, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the housing structure as shown in Figure 2 of Qureshi by providing the non-porous, corrosive-resistant hermetically sealed housing with the distal end of the housing including a sealed window as shown in Nance for the same well-known protection of the camera within the housing from hostile environments when inspecting the interior of chambers for the purposes as claimed (April 4, 2006 Office Action page 4, lines 12-19).

Furthermore, the examiner contends that Heid teaches the technical features of forming a hermetic seal between the proximal end of a housing (*i.e.,* camera 50 of Figure 1 of Heid) and the chamber 12 of Figure 1 of Heid (April 4, 2006 Office Action page 4, lines 15-16). Moreover, that in light of the general knowledge of securing camera housings at the access ports of chambers at the time of Appellant's invention, it would have been obvious to one of ordinary skill in the art to, without difficulty, provide the hermetic seal between the proximal end of the housing and the chamber as taught by Heid as part of the modified system within Qureshi and Nance for the same well-known purpose of protection from chemical leaks or dangerous gases, as claimed (April 4, 2006 Office Action, page 4, line 22 through page 5, line 5).

For the reasons set forth below, the combination of Qureshi, Nance, and Heid, as proposed by the examiner, does not render claims 1, 4, 5, 9, 10, 13, 14, 23, 27, 28, 30 or 31 unpatentable.

1. The Combination of Qureshi, Nance, and Heid is Improper

Prima facie obviousness requires that there be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art to combine the reference teachings. *In re Vaeck*, 947 F.2d 488, 493 (Fed. Cir. 1991); *see also In re Fine*, 5. U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988) (The examiner "can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references."). "Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention absent some teaching, suggestion or incentive supporting the combination." *In re Geiger,* 2 U.S.P.Q.2d 1276, 1278 (Fed. Cir. 1987). "[P]rior art references taken in combination do not make an invention obvious unless something in the prior art references would suggest the advantage to be derived from combining their teachings." *In re Sernaker,* 217 U.S.P.Q. 1, 6 (Fed. Cir. 1983). Moreover, when the motivation to combine the reference teachings is not immediately apparent, "it is the duty of the examiner to explain why the combination of the teachings is proper." *Ex parte Skinner*, 2 U.S.P.Q.2d 1788, 1790 (Bd. Pat. App. & Inter. 1986).

The fact that a prior art device can be modified so as to produce the claimed invention is not a basis for an obviousness rejection unless the prior art suggests the desirability of such a modification. *In re Mills*, 916 F.2d 680, 682 (Fed. Cir. 1990). Moreover,

> [a] statement that modifications of the prior art to meet the claimed invention would have been "'well within the ordinary skill of the art at the time the claimed invention was made'" because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the teachings of the references.

M.P.E.P. § 2143.01 (emphasis original) (*citing Ex parte Levengood*, 28 U.S.P.Q.2d 1300 (Bd. Pat. App. & Inter. 1993)).

In *In re Fine*, the applicant's claimed invention was found obvious by the U.S. Patent and Trademark Office ("USPTO") based upon three prior art patents. Similar to the instant case, the examiner in *In re Fine* merely stated that based upon the prior art teachings, it "would be an

obvious equivalent and would yield the claimed invention." *Fine*, 5 U.S.P.Q.2d at 1598. However, the Federal Circuit reversed the finding of obviousness and held the applicant's claimed invention nonobvious because there was no objective teaching in the prior art references that would lead one of ordinary skill in the art to combine them. The Federal Circuit went on to say

> [o]bviousness is tested by "what the combined teachings of the references would have suggested to those of ordinary skill in the art." *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981). But it "cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination." *ACS Hosp. Sys.*, 732 F.2d at 1577, 221 USPQ at 933. And "teachings of references can be combined only if there is some suggestion or incentive to do so." *Id.* Here, the prior art contains none. ... *One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.*

Fine, 5 U.S.P.Q.2d at 1599-1600 (emphasis added).

The examiner merely states that "it would have been obvious to one of ordinary skill in the art, having Qureshi et al and Nance et al references in front of him/her and the general knowledge of hermetically seal housings with sealed windows associated with inspecting chambers [to modify the reference teachings]." April 4, 2006 Office Action, page 4, lines 12-19. The examiner further explains his position by stating that "[i]n this case, even if suggestion for combination is not particularly specified in Qureshi, Nance, or Heid, the question in the test for combining references in a section 103 rejection is not solely relied on what the individual reference expressly teaches." April 4, 2006 Office Action, page 12, lines 9-12 (*citing In re McLaughlin*, 170 U.S.P.Q. 209 (C.C.P.A. 1971) ("the test for combining references is not what the individual references themselves suggest but rather what the combination of disclosures taken as a whole would suggest to one of ordinary skill in the art."). In addition, the examiner states that "[t]herefore, even though Qureshi, Nance, or Heid taken singularly suggests the combination as claimed, the combination of Qureshi, Nance, and Heid taken as a whole would have been obvious to one of ordinary skill in the art for the above reasons." April 4, 2006 Office Action, page 12 (emphasis added). Notably, in contrast to the examiner's assertion, no reasons have been provided as to why the combination of references would have been obvious.

The examiner has not cited to any suggestion or motivation within the prior art references to modify the teachings such that one of ordinary skill in the art would arrive at the claimed invention. The examiner merely states that one of ordinary skill in the art "would have no difficulty in modifying [the prior art] for the same well known protection of the camera within the housing from hostile environments when inspecting the interior of chambers purposes as claimed." April 4, 2006 Office Action, page 4, lines 12-19. The blanket statement that one of ordinary skill in the art would have "no difficulty" in making the suggested combination is insufficient for supporting a combination of the references, especially considering the lack of applicability of Nance and Heid with respect to the teaching of the admitted deficiencies of Qureshi. *See Ex parte Levengood*, 28 U.S.P.Q.2d 1300, 1301-1302 (Bd. Pat. App. & Inter. 1993) ("At best, the examiner's comments regarding obviousness amount to an assertion that one of ordinary skill in the relevant art would have been able to arrive at appellant's invention because he had the necessary skills to carry out the requisite process steps. This is an inappropriate standard for obviousness"). To establish *prima facie* obviousness requires that there be some objective reason to combine the teachings of the references, which as discussed above, the examiner has not shown. *Levengood*, 28 U.S.P.Q.2d at 1302 (*citing In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988) and *In re Newell*, 891 F.2d 899 (Fed. Cir. 1989)); *see also Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 1323-24 (Fed. Cir. 1999).

Not only is there no objective teaching in Qureshi, Nance or Heid to make the combination suggested by the examiner, Qureshi, Nance, and Heid actually teach away from each other. The Qureshi manhole must be open during ordinary use of the inspection system. Because of this, one of ordinary skill in the art reading Qureshi would understand that the tank being inspected by the Qureshi system would not be hermetically sealed as such would not be practical. Nance merely discloses a double walled test tube-like structure having a hermetically sealed chamber between the inner and outer walls of the test tube (Nance col. 4, lines 30-36), while Heid discloses a furnace with a camera positioned on top (Heid col. 3, lines 14-15). Additionally, and importantly the Qureshi system is designed specifically to be portable from tank to tank in order to allow a single inspection system to be used to inspect multiple tanks in series, whereas the systems disclosed by Nance and Heid are intended for use with the same system *i.e.*, a Defense Waste Processing Facility or furnace, and are not suggested to be portable. Therefore, one of ordinary skill in the art reviewing the portable, non-hermetically sealed

inspection system of Qureshi would not be motivated to seek hermetic sealing or a rigidly secured housing and so would not look to Nance or Heid.

Further, if the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose due to teaching away or other reasons, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 902 (Fed. Cir. 1984)). The claimed device of Qureshi is a portable monitoring system for inspecting the interior of tank cars. Nance teaches the use of a hermetically sealed dual layer wall chamber configured as a test tube to act as an insulator open on one end and having a camera therein to shield it from the hostile environment. The open end of the test tube is positioned outside the hostile environment such that the hostile environment does not enter the test tube through the open end. Heid teaches that a camera can be on top of a furnace. Thus, if there was a motivation to combine, for the sake of argument, applying the teachings of Nance and Heid would result in a modification of the claimed device in Qureshi that is permanently sealed to a tank car and has a monitoring sensor protected by a double walled test tube-like insulting layer. Such a modified device as claimed in Qureshi would render it unsatisfactory for its intended purpose, which is to be a portable device that can be used to inspect multiple railroad tank cars. That is, hermetically sealing the device to the tank car would limit its application to a single tank car, and subsequently render the tank car itself useless for its intended purpose *i.e.*, as a storage transport container. Moreover, if the device were portable, any such seal would serve no purpose as it would have to be continuously attached and detached rendering it open to the atmosphere.

Thus, for the foregoing reasons, the combination of Qureshi, Nance, and Heid is improper. The examiner has not explained why the combination is proper and as a result has not met his duty of establishing *prime facie* obviousness with respect to claims 1, 4, 5, 9, 10, 13, 14, 23, 27, 28, 30, and 31.

2. The Combination of Qureshi, Nance, and Heid Fails to Provide a Reasonable Expectation of Success

Even if the combination proposed by the examiner were proper, which it is not, a person of ordinary skill in the art would not have been motivated to make the combination because the combination fails to provide a reasonable expectation of success. If the proposed modification

would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon,* 733 F.2d 900, 902 (Fed. Cir. 1984).

The purpose of Qureshi is to eliminate the need for workers to physically climb into railroad tank cars in order to visually inspect the interiors thereof by providing a system for removably and remotely visually inspecting the interior of the railroad tank cars (col. 1, lines 28-47). The Qureshi system is portable and is lowered into an open manway hole on a railroad tank car to inspect the interior of the tank and then removed therefrom to allow the system to be inserted into another railroad tank car to inspect the interior of the tank of that car so that the first tank car can then be filled and used after inspection (col. 1, line 55-65). In this way, the Qureshi system allows for the inspection of the interior of multiple tank cars without putting workers at risk of becoming impaired or overcome by vapors or fumes within the tank (col. 1, lines 42-46 and col. 5, lines 35-38). Securing the system to the tank wall at one manway (or other access port) on one railroad tank car as suggested by the examiner in a "modified" Qureshi/Nance device and forming a hermetic seal between the proximal end of the system and the tank would prevent the system of Qureshi from operating in its intended manner to inspect multiple tank cars. Accordingly, one of ordinary skill in the art would not believe that the portable system would be successful if the device were hermetically sealed to the tank car as the modifications proposed by the examiner would render it unsatisfactory for its intended purpose. If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *See In re Ratti,* 270 F.2d 810 (C.C.P.A. 1959).

Further, in order to be able to combine Qureshi, Nance, and Heid, the combination must not require substantial reconstruction and redesign of the elements shown in Qureshi or require a substantial change of the basic principles under which the Qureshi system was designed to operate. *Id.* at 813.

The combination proposed by the examiner would change the principle of operation of Qureshi because the modified Qureshi device would be required to be secured to an access port of the tank to form a hermetic seal between a proximal end of the housing and the tank. As

discussed above, doing so would prevent the use of the system to inspect multiple railroad tank cars by requiring the system to be secured to a single railroad tank car and/or be moot since upon removal, to inspect the next car, it would be open to the atmosphere.

If one were to modify the Qureshi system as proposed by the examiner, the Qureshi system would also require reconstruction and redesign of the elements thereof in order to make the system operational and/or transportable with the railroad tank car, thereby changing the basic principle under which Qureshi is designed to operate, and consequently be incapable for its intended use as it would no longer be capable of use in successive cars. Accordingly, one of ordinary skill in the art would not modify Qureshi as the examiner has proposed, because doing so would change the principle of operation of the Qureshi system, require substantial modification and/or not provide a reasonable expectation of success.

Accordingly, as set forth in Section C, herein *supra*, the combination fails to teach all elements of claims 1, 4, 5, 9, 10, 13, 14, 23, 27, 28, 30, and 31, and as noted in Sections D.1. and D.2, it further does not provide an objective teaching to combine the references or a reasonable expectation of success to make the proposed modifications.

E. THE EXAMINER HAS FAILED TO ESTABLISH *PRIMA FACIE* OBVIOUSNESS OF CLAIMS 2, 11, AND 25 UNDER 35 U.S.C. §103(a) OVER QURESHI, NANCE AND HEID AND FURTHER IN VIEW OF SHATTUCK

The examiner has rejected claims 2, 11, and 25 under 35 U.S.C. § 103(a) as being unpatentable over Qureshi, Nance, and Heid as applied above, and further in view of Shattuck.

The examiner contends that the combination of Qureshi, Nance, and Heid discloses substantially the same system as the claimed invention. However, the examiner concedes that the combination does not disclose a housing comprising a flexible sheath formed of stainless steel bellows, as claimed in claims 2, 11, and 25 (April 4, 2006 Office Action page 5, lines 9-11). The examiner asserts that the particular use of stainless steel bellows for housing structures associated with borescopes and monitoring of chambers is old and well-recognized in the art, citing Shattuck as exemplary of this assertion (April 4, 2006 Office Action page 5, lines 12-14). Therefore it would have been obvious to one of ordinary skill in the art to provide the stainless steel bellows structure of Shattuck for the housing of Qureshi.

Shattuck is directed to electrostatic probes 27-29 for the electrostatic monitoring of gas turbine engines 10 (col. 1, lines 6-11 and col. 2, lines 51-52). The probes 27-29 are configured to be inserted into and removed from borescope access ports of the gas turbine engine 10 (col. 3, lines 64-66). The probes 27-29 extend through a fan duct 22 to allow the tips of the probes 27-29 to enter a burn can 20 of the gas turbine engine 10 for the monitoring thereof (col. 2, lines 45-47). In one embodiment, Shattuck discloses the use of high pressure, flexible, metallic tubing, such as an inner, stainless steel bellows tubing surrounded by woven stainless steel mesh, for use with the probes 27-29 in the instances where there is a differential before and after expansion between inner and outer walls 24, 25 of the fan duct 22 of the gas turbine gas engine 10 (col. 4, lines 6-25).

1. The Combination of Qureshi, Nance, Heid, and Shattuck is Improper

Qureshi, Nance, Heid, and Shattuck are not properly combinable under 35 U.S.C. § 103(a) to render the present invention obvious. As stated above with respect to Qureshi, Nance, and Heid, the examiner has not pointed to an objective teaching in either Qureshi, Nance, or Heid, which would lead one skilled in the art to combine each of the references. Similarly, the examiner has not pointed to an objective teaching in Shattuck that would lead one to combine Shattuck with Qureshi, Nance, or Heid.

In this combination the examiner has relied on non-analogous art which is not pertinent to the problem with which the invention was concerned, in his rejection of claims 2, 11, and 25. Appellant, in conceiving the present invention, was presented with the problem of monitoring one or more parameters or making visual inspections of substantial portions of the interior of a sealed chamber having an environment hostile to monitoring equipment, such as a chemical reactor or a semiconductor processing chamber, thereby requiring, as in claims 2, 11, and 25, a flexible protective housing to protect the monitoring equipment.

In contrast, Qureshi is directed to an inspection system which does not teach or suggest protection of the monitoring equipment, focusing instead on the portability and movable aspect of the system. Since the cars are empty during inspection, while fumes and the like may be present that could overcome workers if they had to physically enter the tank car, it is not at all clear that the environment would be so hostile as to require protection of the monitoring

equipment. Particularly since the tanks are empty and open to the atmosphere upon insertion of the device. While Shattuck suggests a bellows tubing for a distal end of the housing, Shattuck discloses (1) bellows tubing accommodating only conductors, and does not disclose bellows tubing for the housing of monitoring equipment; and (2) bellows tubing which is open at one end, and therefore is also not hermetically sealed. Also, and most importantly, the probe (including the bellows tubing) disclosed by Shattuck is not disclosed or even suitable for housing a borescope, but, as clearly stated at col. 1, lines 64-66 of Shattuck, the probe as a whole is merely adapted for insertion into a borescope access port of an engine. For at least these reasons, the combination of Qureshi, Nance, Heid, and Shattuck is improper.

2. Motivation Notwithstanding, The Claimed Invention Does Not Result From the Combination of Qureshi, Nance, Heid, and Shattuck

Even if the combination of Qureshi, Nance, Heid, and Shattuck were proper, it fails to teach or suggest all of the elements of claims 2, 11, and 25.

As previously argued above in Section C, the combination Qureshi, Nance, and Heid does not disclose all the elements of the claimed invention. Thus, even if Shattuck were properly combined with these references, Shattuck fails to cure the deficiencies of Qureshi, Nance, and Heid. That is, like the combination of Qureshi, Nance, and Heid, Shattuck also has no disclosure of a hermetically sealed housing having, within an interior thereof, a transmission media or sensor for transmitting an image or an output signal from the distal end of the housing to the proximal end of the housing, and rigidly securing the proximal end of the housing to the chamber wall at an access port to form a hermetic seal between the proximal end of the housing and the chamber.

Accordingly, the combination of Qureshi, Nance, Heid, and Shattuck fails to teach all elements of claims 2, 11, and 25, and as noted above, does not provide an objective teaching to combine the references.

F. THE EXAMINER HAS FAILED TO ESTABLISH *PRIMA FACIE* OBVIOUSNESS OF CLAIMS 3, 12, AND 26 UNDER 35 U.S.C. §103(a) OVER QURESHI, NANCE, AND HEID AND FURTHER IN VIEW OF CHIODO

The examiner has rejected claims 3, 12, and 26 under 35 U.S.C. § 103(a) as being unpatentable over Qureshi, Nance, and Heid as applied above and further in view of Chiodo.

The examiner admits that Qureshi, Nance, and Heid does not disclose a housing comprising a flexible polymeric tube, as in claims 3, 12, and 26 (April 4, 2006 Office Action page 6, lines 4-6). However, the examiner contends that the particular use of flexible polymeric tubes for a housing associated with a camera monitoring device is old and well-recognized in the art, citing Chiodo as exemplary (April 4, 2006 Office Action page 6, lines 6-8). The examiner further asserts that it would have been obvious to one of ordinary skill in the art to provide the flexible polymeric tube structure of Chiodo for the "housing" of Qureshi, (described by the examiner as being made up of elements 31, 32, 37, 38, and 41 of Figs. 2 and 8 of Qureshi) in the examiner's rejection citing the primary combination (April 4, 2006 Office Action page 6, lines 9-14).

Chiodo is directed to a medical apparatus for photographing body cavities (*see* Chiodo Abstract). The apparatus includes an upper camera 1, a lower camera 2, and a lighting device 3 arranged in a generally tubular housing (col. 2, lines 52-56). Disposed at one end of the tubular housing is an open ended metal cap 39 to which a rubber tube 54 is permanently connected (col. 4, lines 14-20). Within the rubber tube 54, there is a shutter operating member, which is generally a resilient wire 67 surrounded by a stiffening wire coil 69 (col. 4, lines 20-23). The tube 54, resilient wire 67, and stiffening wire coil 69 connect the tubular housing with an operating mechanism (col. 4, lines 54-58 and Figure 2).

1. The Combination of Qureshi, Nance, Heid, and Chiodo is Improper

Qureshi, Nance, Heid, and Chiodo are not properly combinable over 35 U.S.C. § 103(a) to render the present invention obvious. First, the examiner has not pointed to an objective teaching in any of these patents that provides motivation or suggestion for such a combination. Second the Qureshi patent is concerned with the inspection of a generally open railroad tank car, whereas the Chiodo patent is concerned with a closed system for medical use for inspecting the

interior of a body cavity. The Qureshi device is not sealed, whereas the device of the Chiodo patent is sealed. Third, as the art of Chiodo is not in the same field of endeavor and as Qureshi, Nance, and Heid, and the references have divergent purposes, the combination is a piecemeal attempt to reconstruct the claims using impermissible hindsight. Therefore, for at least these reasons, the combination of Qureshi, Nance, Heid, and Chiodo is improper.

2. Motivation Notwithstanding, The Claimed Invention Does Not Result From the Combination of Qureshi, Nance, Heid, and Chiodo

Even if the combination of Qureshi, Nance, Heid, and Chiodo were proper, the combination fails to teach or suggest all elements of claims 3, 12, and 26.

The Chiodo patent does not make up for the deficiencies previously argued above in Section C with respect to the combination of Qureshi, Nance and Heid as applied to claims 1, 9, and 23 from which claims 3, 12, and 26 depend. Specifically, Chiodo does not teach or suggest a hermetically sealed housing having, within an interior thereof, a transmission media for transmitting an image or an output signal from the distal end of the housing to the proximal end of the housing, or rigidly securing the proximal end of the housing to the chamber wall at an access port to form a hermetic seal between the proximal end of the housing and the chamber.

Accordingly, the combination of Qureshi, Nance, Heid, and Chiodo fails to teach all elements of claims 3, 12, and 26, and as noted above, does not provide an objective teaching to combine the references.

G. THE EXAMINER HAS FAILED TO ESTABLISH *PRIMA FACIE* OBVIOUSNESS OF CLAIMS 6, 7, 17, 20, AND 21 UNDER 35 U.S.C. §103(a) OVER QURESHI, NANCE, AND HEID AND FURTHER IN VIEW OF HOWELL

The examiner has rejected claims 6, 7, 17, 20, and 21 under 35 U.S.C. § 103(a) over Qureshi, Nance, and Heid and further in view of Howell.

The examiner has conceded that the primary combination of Qureshi, Nance, and Heid does not particularly disclose the housing including a borescope having a viewing end which is aligned with the sealed window, the interior of the housing including a flexible borescope for transmitting images of the interior of the chamber obtained through the window from the distal

end of the housing to the proximal end of the housing and through the port, and a monitor located outside of the chamber and connected to the borescope for receiving and displaying images of the interior of the chamber and wherein the transmission media is comprised of a fiber optic bundle, as claimed in claims 6, 7, and 17 (April 4, 2006 Office Action page 6, line 18 through page 7, line 3). However, the examiner contends that Howell discloses a borescope guide tube and teaches the conventional use of a fiber optic bundle borescope having a viewing end that is aligned with a sealed window, as well as the other above-listed admitted deficiencies of the primary combination (April 4, 2006 Office Action page 7, lines 4-12). Thus, the examiner concludes that it would have been obvious to one of ordinary skill in the art to provide the fiber optic bundle borescope for transmitting and monitoring of images, as taught by Howell, as part of the chamber monitoring system within Qureshi (April 4, 2006 Office Action page 7, lines 12-18).

Howell discloses a borescope guide tube 70 for use with a borescope 62 (col. 5, lines 20-22). The guide tube 70 is formed of a semi-rigid plastic material (col. 5, lines 22-24). The tube 70 has an inlet 72 and an outlet 74, each formed of a sufficient size to accept the borescope 62 therein (col. 5, lines 31-33). It is contemplated that the borescope 62 used with the guide tube 70 be of the flexible fiber optic borescope variety (col. 2, lines 52-59). It is intended that the borescope 62 and guide tube 70 be used to inspect the interiors of gas turbine engines (col. 2, lines 48-51).

1. The Combination of Qureshi, Nance, Heid, and Howell is Improper

Qureshi, Nance, Heid, and Howell are not properly combinable under 35 U.S.C. § 103(a). As stated above in Section C with respect to Qureshi, Nance and Heid, and as now stated with respect to Howell, the examiner has not pointed to an objective teaching in Qureshi, Nance or Heid, which would lead one skilled in the art to combine Qureshi, Nance, and Heid with Howell. Similarly, the examiner has not pointed to an objective teaching in Howell which would lead one to combine Howell with Qureshi, Nance, and Heid. Therefore, for at least these reasons, the combination of Qureshi, Nance, Heid, and Howell is improper.

2. Motivation Notwithstanding, The Claimed Invention Does Not Result From the Combination of Qureshi, Nance, Heid, and Howell

Even if the combination were proper, which it is not, the combination of Qureshi, Nance, Heid, and Howell fails to teach or suggest each and every element of the claims 6, 7, 17, 20, and 21. As discussed above, the primary combination does not teach or suggest either a hermetically sealed housing having, within an interior thereof, a transmission media for transmitting an image from the distal end of the housing to the proximal end of the housing, or a housing rigidly secured to the chamber wall at an access port to form a hermetic seal between the proximal end of the housing and the chamber, as recited in claim 1 and dependent claims 6 and 7. Furthermore, the Howell patent does not add anything that overcomes the deficiencies of the primary combination with respect to independent claim 1. Accordingly, the present combination including Howell fails to teach or suggest all the elements of claims 6 and 7 for these reasons and those discussed above in Section C with respect to independent claim 1.

Independent claim 17 recites, *inter alia,* a hermetically sealed housing including a flexible borescope for transmitting images obtained through the window at the distal end of the housing, the sealed housing being rigidly secured to the wall of a chamber to form a hermetic seal with the chamber. As discussed above, the primary combination does not teach or suggest a hermetically sealed housing, secured to the wall of a container to form a hermetic seal, nor does it teach rigidly securing the housing to the wall. While Howell discloses a guide tube for directing a borescope, Howell does not teach or suggest a hermetically sealed housing, rigidly secured to the wall of a chamber to form a hermetic seal with a chamber. Therefore, for at least these reasons, the combination does not teach or suggest all the elements of independent claim 17.

Claims 20 and 21 depend from claim 17. Accordingly, it is respectfully submitted that claims 20 and 21 are patentable over the combination by virtue of their dependency from and for the reasons discussed above with respect to independent claim 17.

3. The Combination of Qureshi, Nance, Heid, and Howell Fails to Provide a Reasonable Expectation of Success

Even if the combination proposed by the examiner taught or suggested all elements of the invention, which it does not, a person of ordinary skill in the art would not have had any reasonable expectation of success in producing the claimed invention.

One of ordinary skill in the art would expect that, by routing a borescope through the joints and articulated segments of the Qureshi inspection arm, the maneuverability of the inspection arm would be unnecessarily decreased if not eliminated, especially considering that there is no reason to use a borescope with the Qureshi system since borescopes are typically used for capturing images of smaller, confined spaces. It is not difficult to access the inside of a railroad tank car, for which the Qureshi inspection system is designed to inspect. The inside of a railroad tank car is sufficiently large to allow access of a larger camera. In fact, the inside of a railroad tank car is sufficiently large to allow a worker to climb inside and visually inspect the interior thereof, as is conventionally done according to Qureshi (col. 1, lines 28-30). Accordingly, a person of ordinary skill in the art would not have had a reasonable expectation that making such a combination would result in a monitoring system for a hostile environment.

Accordingly, the combination of Qureshi, Nance, Heid, and Howell fails to teach all elements of claims 6, 7, 17, 20, and 21, and as noted above, does not provide an objective teaching to combine the references or a reasonable expectation of success to make the proposed modification.

H. THE EXAMINER HAS FAILED TO ESTABLISH *PRIMA FACIE* OBVIOUSNESS OF CLAIMS 8, 15, 16, 24, AND 29 UNDER 35 U.S.C. §103(a) OVER QURESHI, NANCE, AND HEID AND FURTHER IN VIEW OF BRAITHWAITE

The examiner has rejected claims 8, 15, 16, 24, and 29 under 35 U.S.C. § 103(a) over Qureshi, Nance, and Heid and further in view of Braithwaite.

The examiner contends that the primary combination of Qureshi, Nance, and Heid discloses substantially the same optical monitoring system as claimed, but admits that it does not particularly disclose (a) an interior of the housing which is provided with a fluid under pressure to control the environment within the interior of the housing, as claimed in claims 8, 16, and 29;

(b) a camera which is an infrared camera, as claimed in claim 15; and (c) a sensor which is selected from the group consisting of a temperature sensor, a pressure sensor, and oxygen sensor, and a spectrographic chemical analysis sensor, as claimed in claim 24 (April 4, 2006 Office Action page 8, lines 1-12). The examiner further contends that Braithwaite discloses an apparatus and method for measuring extensional rheological (fluid flow) properties of a material and teaches the conventional fluid pressure control of an environment within the interior of a housing, temperature sensors, and the use of infrared cameras for monitoring elements within the housing (April 4, 2006 Office Action page 8, lines 13-17). The examiner concludes that it would have been obvious to one of ordinary skill in the art to provide the infrared camera, temperature sensor, and fluid pressure control system of Braithwaite for the interior of the housing of Qureshi (April 4, 2006 Office Action page 8, line 17 through page 9, line 2).

Braithwaite is directed to an apparatus and method for measuring extensional rheological properties of a material (see Braithwaite Abstract). The apparatus 10 includes opposed surfaces 110, 112, which define a sample site 120 (page 3, paragraph [0036]). The opposed surface 110 moves axially along an axis 160 using a plunger system 170 (page 3, paragraph [0036]). The apparatus 10 further includes a light source 140, which provides a light beam 144 (page 3, paragraph [0036]). The light beam 144 passes through the sample site 120 and is recorded by a light detector 150, which is in communication with a data collector such as a personal computer 180 (page 3, paragraph [0036]). The sample site 120 is held within a housing 130, which permits the controlling of ambient conditions (page 3, paragraph [0036]). The ambient conditions of the housing 130 can be controlled by a heating system 134, such as an oven and a temperature controller 136, to provide control over the temperature of the sample site 120 and the environment surrounding the sample site 120 (page 3, paragraph [0040]). Alternatively, a cooler 138 may be used for sub-ambient temperature control (page 3, paragraph [0040]). Relative humidity and partial pressure of gases may also be controlled within the housing 130 by circulating conditioned gas into and out of the housing 130 (page 3, paragraph [0040]).

1. The Combination of Qureshi, Nance, Heid, and Braithwaite is Improper

In this instance, the examiner argues that if someone had the references before them and had general knowledge of hostile environment monitoring, then they would combine Braithwaite with the other references and include the Braithwaite features in the housing of the "modified"

Qureshi system. However, as with the primary combination, the examiner has failed to provide an objective teaching within the references to suggest making such a combination. Moreover, Braithwaite is non-analogous art as monitoring rheological properties of fluid flow would not be useful for monitoring empty tank cars as in Qureshi. Accordingly, for these reasons, and those previously discussed with respect to the primary combination in Section D.1., the combination of Qureshi, Nance, Heid, and Braithwaite is improper.

2. Motivation Notwithstanding, The Claimed Invention Does Not Result From the Combination of Qureshi, Nance, Heid, and Braithwaite

Even if the combination of Qureshi, Nance, Heid, and Braithwaite were proper, it fails to teach or suggest all the elements of claims 8, 15, 16, 24, and 29. As discussed above, the primary combination of Qureshi, Nance, and Heid does not disclose all the elements of the claimed invention. Moreover, Braithwaite is insufficient to overcome the deficiencies noted above, specifically a hermetically sealed housing having, within an interior thereof, a transmission media for transmitting an image or an output signal from the distal end of the housing to the proximal end of the housing, and rigidly securing the proximal end of the housing to the chamber wall at an access port to form a hermetic seal between the proximal end of the housing and the chamber. Plus, with respect to claims 8, 16, and 29, Braithwaite does not teach or suggest controlling an environment within an interior of a housing within which sensors and/or cameras are located for the monitoring of an environment outside of the housing. Instead, Braithwaite discloses an apparatus for measuring properties inside a sample site, which controls the environment of the sample site, maintaining it at a desired pressure and temperature (*see* Braithwaite page 3, paragraphs [0035] and [0040]). The monitoring equipment used to monitor the sample site (the light source and light detector) is located outside of the sample site and is not within the controlled environment (*see* Braithwaite page 3, paragraphs [0035] and Figure 1). Additionally, with respect to claim 24, Braithwaite does not disclose a spectrographic chemical analysis sensor. Therefore, for at least these reasons, the combination fails to teach or suggest all the elements of claims 8, 15, 16, 24, and 29.

3. The Combination of Qureshi, Nance, Heid, and Braithwaite Fails to Provide a Reasonable Expectation of Success

Even if the combination proposed by the examiner taught or suggested all the elements of the invention, which it does not, a person of ordinary skill in the art would not have had any reasonable expectation of success. One of or ordinary skill in the art would not have considered the combination, because in so carrying out the combination, one would have had no reasonable expectation of being able to control the environment within each of the separate articulated segments of the inspection arm of Qureshi using fluid under pressure. This is particularly so since the interior of the open manway of Qureshi does not involve a flowing fluid requiring rheological measurement.

Accordingly, the combination of Qureshi, Nance, Heid, and Braithwaite fails to teach all elements of claims 8, 15, 16, 24, and 29, and as noted above, does not provide an objective teaching to combine the references or a reasonable expectation of success to make the proposed modification.

I. THE EXAMINER HAS FAILED TO ESTABLISH *PRIMA FACIE* OBVIOUSNESS OF CLAIM 18 UNDER 35 U.S.C. §103(a) OVER QURESHI, NANCE, HEID, AND HOWELL AND FURTHER IN VIEW OF SHATTUCK

The examiner contends that the combination of Qureshi, Nance, Heid, Howell, and Shattuck discloses substantially the same optical monitoring system as claimed, but admits that the combination does not particularly disclose wherein the housing comprises a flexible sheath formed of a stainless steel bellows (April 4, 2006 Office Action page 9, lines 7-10). For the reasons set forth in the above arguments in Sections C, E, and G, Appellant respectfully submits that Qureshi, Nance, Heid, Howell, and Shattuck does not render claim 18 obvious under 35 U.S.C. §103(a).

J. THE EXAMINER HAS FAILED TO ESTABLISH *PRIMA FACIE* OBVIOUSNESS OF CLAIM 19 UNDER 35 U.S.C. §103(a) OVER QURESHI, NANCE, HEID, AND HOWELL AND FURTHER IN VIEW OF CHIODO

The examiner contends that the combination of Qureshi, Nance, Heid, Howell, and Chiodo discloses substantially the same optical monitoring system as claimed, but admits that the

combination does not particularly disclose wherein the housing comprises a flexible polymeric tube (April 4, 2006 Office Action page 10, lines 5-10). For the reasons set forth in the above arguments in Sections C, F, and G, Appellant respectfully submits that Qureshi, Nance, Heid, Howell, and Chiodo does not render claim 19 obvious under 35 U.S.C. §103(a).

K. THE EXAMINER HAS FAILED TO ESTABLISH *PRIMA FACIE* OBVIOUSNESS OF CLAIM 22 UNDER 35 U.S.C. §103(a) OVER QURESHI, NANCE, HEID, AND HOWELL AND FURTHER IN VIEW OF BRAITHWAITE

The examiner contends that the combination of Qureshi, Nance, Heid, Howell, and Braithwaite discloses substantially the same optical monitoring system as claimed, but admits that the combination does not particularly disclose wherein the interior of the housing is provided a fluid under pressure to control the environment within the interior of the housing (April 4, 2006 Office Action page 10, line 20 through page 11, line 1). For the reasons set forth in the above arguments in Sections C, G, and H, Appellant respectfully submits that Qureshi, Nance, Heid, Howell, and Braithwaite does not render claim 22 obvious under 35 U.S.C. §103(a).

L. EVEN IF THE EXAMINER HAD SHOWN *PRIMA FACIE* OBVIOUSNESS, THE INVENTION AS CLAIMED DEMONSTRATES SECONDARY CONSIDERATIONS WHICH OVERCOME ANY SUCH *PRIMA FACIE* OBVIOUSNESS

Even if the Examiner had shown *prima facie* obviousness based on any of the above combinations, which he did not, the invention as claimed would not be rendered obvious under 35 U.S.C. § 103(a). Prior to Appellant's invention, there was a long-felt need in the art for a device capable of viewing and/or monitoring the conditions within hostile environments, such as the environments present within semiconductor wafer processing chambers. The production of semiconductor wafers requires careful monitoring so as to reduce the likelihood of producing defective or otherwise substandard wafers. Because of the size of the wafers currently being produced and the number of individual chips that can be produced per wafer, the production of just one defective wafer could result in a monetary loss in the hundreds of thousands of dollars. Therefore, should a problem arise during wafer production, it is imperative that the problem is quickly diagnosed and corrected in order to prevent the production of a defective wafer.

Prior to the claimed invention, such problems could only be diagnosed after the

production of a defective wafer, or by visually inspecting the operation of a semiconductor wafer processing chamber through a window within the wall of the chamber. As stated above, discovery of the problem after a defective wafer is produced creates large monetary losses. Monitoring of the process through a window within the chamber is also an imperfect solution because one may not always be able to visually diagnose a problem within the chamber. For example, it is difficult, if not impossible, to realize changes in pressure or temperature within the chamber, which could result in the production of a defective wafer, by merely viewing the inside of the chamber through a window. Moreover, such windows introduce the possibility of leaking, thereby allowing the escape of potentially harmful chemicals from the chamber and/or the entry into the chamber of contaminants, which are harmful to wafer production.

For this reason, there was a long-felt need in the art to have a monitoring system within the chamber in order to monitor one or more parameters, such as temperature and pressure, within the semiconductor wafer processing chamber (specification page 1, lines 16-18). However, the use of existing, standard, unprotected monitoring equipment within such a chamber is ineffective because most existing monitoring equipment is simply not constructed to withstand the severe pressures, temperatures, and harmful chemicals present within the chamber (specification page 1, lines 20-25). The monitoring system of the present invention overcomes this problem and fills the long-felt need by providing protection for the sensitive measuring and/or monitoring equipment to enable such equipment to be placed within chambers having a hostile environment (specification page 1, lines 25-29). In this way, the monitoring system of the present invention can be used for calibration, inspection, and maintenance within the chamber during operation of the chamber, thereby allowing for relatively quick diagnosis and correction of problems without the necessity of having to shut down operation of the chamber and open it up (specification page 2, lines 1-2). Moreover, because the chamber need not be opened up, the likelihood of contamination entering the chamber is reduced. Therefore, even if the examiner had shown *prima facie* obviousness, it is overcome because there was a long-felt need in the art for a device such as the invention claimed.

CONCLUSION

For the reasons set forth above, Appellant respectfully requests withdrawal of all grounds of rejection and allowance of the pending application claims.

Respectfully submitted,

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VIII. CLAIMS APPENDIX

Claim 1. (Previously presented). An optical monitoring system for transmitting images from a hostile environment within the interior of a sealed chamber to the chamber exterior, the chamber having a wall and an access port extending through the wall, the monitoring system comprising:

a flexible, generally tubular, elongated, hermetically sealed housing having a distal end, a proximal end and an interior,

the housing being made of a non-porous, corrosive resistant material,

the distal end of the housing including a sealed window,

the proximal end of the housing being rigidly secured to the chamber wall at the access port to form a hermetic seal between the proximal end of the housing and the chamber,

the interior of the housing being accessible through the access port,

the interior of the housing including a transmission media for transmitting images of the interior of the chamber obtained through the window from the distal end of the housing to the proximal end of the housing and through the access port; and

a monitor located outside of the chamber and connected to the transmission media for receiving and displaying the images of the interior of the chamber.

Claim 2. (Original). The optical monitoring system as recited in claim 1, wherein the housing comprises a flexible sheath formed of a stainless steel bellows.

Claim 3. (Original). The optical monitoring system as recited in claim 1, wherein the housing comprises a flexible polymeric tube.

Claim 4. (Original). The optical monitoring system as recited in claim 1, wherein the window is formed from a material selected from the group consisting of synthetic sapphire, glass, quartz and a polymeric material.

Claim 5. (Original). The optical monitoring system as recited in claim 4, wherein the window is secured to the housing by a method selected from the group consisting of brazing, fusion and an adhesive.

Claim 6. (Original). The optical monitoring system as recited in claim 1, wherein the housing includes a borescope having a viewing end which is aligned with the sealed window.

Claim 7. (Original). The optical monitoring system as recited in claim 1, wherein the transmission media is comprised of a coherent fiber optic bundle.

Claim 8. (Original). The optical monitoring system as recited in claim 1, wherein the interior of the housing is provided with a fluid under pressure to control the environment within the interior of the housing.

Claim 9. (Previously presented). An optical monitoring system for transmitting images from a hostile environment within the interior of a sealed chamber to the chamber exterior, the chamber having a wall and an access port extending through the wall, the monitoring system comprising:

a flexible, generally tubular, elongated, hermetically sealed housing having a distal end, a proximal end and an interior,

the housing being made of a non-porous, corrosive resistant material,

the distal end of the housing including a sealed window and a camera positioned to record images of the interior of the chamber through the window,

the proximal end of the housing being rigidly secured to the chamber wall at the access port to form a hermetic seal between the proximal end of the housing and the chamber,

the interior of the housing being accessible through the access port,

the interior of the housing including a transmission media for transmitting the images of the interior of the chamber recorded by the camera from the distal end of the housing to the proximal end of the housing and through the access port; and

a monitor located outside of the chamber and connected to the transmission media for receiving and displaying the recorded images of the interior of the chamber.

Claim 10. (Original). The optical monitoring system as recited in clam 9, wherein the camera is a video camera.

Claim 11. (Original). The optical monitoring system as recited in claim 9, wherein the housing comprises a flexible sheath formed of a stainless steel bellows.

Claim 12. (Original). The optical monitoring system as recited in claim 9, wherein the housing comprises a flexible polymeric tube.

Claim 13. (Original). The optical monitoring system as recited in claim 9, wherein the window is formed from a material selected from the group consisting of synthetic sapphire, glass, quartz and a polymeric material.

Claim 14. (Original). The optical monitoring system as recited in claim 9, wherein the window is secured to the housing by a method selected from the group consisting of brazing, fusion and an adhesive.

Claim 15. (Previously presented). The optical monitoring system as recited in claim 9, wherein the camera is an infrared camera.

Claim 16. (Original). The optical monitoring system as recited in claim 9, wherein the interior of the housing is provided with a fluid under pressure to control the environment within the interior of the housing.

Claim 17. (Previously presented). An optical monitoring system for transmitting images from a hostile environment within the interior of a sealed chamber to the chamber exterior, the chamber having a wall and an access port extending through the wall, the monitoring system comprising:

a flexible, generally tubular, elongated, hermetically sealed housing having a distal end, a proximal end and an interior,

the housing being made of a non-porous corrosive resistant material,

the distal end of the housing including a sealed window,

the proximal end of the housing being rigidly secured to the chamber wall at the access port to form a hermetic seal between the proximal end of the housing and the chamber,

the interior of the housing being accessible through the access port,

the interior of the housing including a flexible borescope for transmitting images of the interior of the chamber obtained through the window from the distal end of the

housing to the proximal end of the housing and through the access port; and

a monitor located outside of the chamber and connected to the borescope for receiving and displaying the images of the interior of the chamber.

Claim 18. (Original). The optical monitoring system as recited in claim 17, wherein the housing comprises a flexible sheath formed of a stainless steel bellows.

Claim 19. (Original). The optical monitoring system recited in claim 17, wherein the housing comprises a flexible polymeric tube.

Claim 20. (Original). The optical monitoring system as recited in claim 17, wherein the window is formed from a material selected from the group consisting of synthetic sapphire, glass, quartz and a polymeric material.

Claim 21. (Original). The optical monitoring system as recited in claim 17, wherein the window is secured to the housing by a method selected from the group consisting of brazing, fusion and an adhesive.

Claim 22. (Original). The optical monitoring system as recited in claim 17, wherein the interior of the housing is provided with a fluid under pressure to control the environment within the interior of the housing.

Claim 23. (Previously presented). A monitoring system for monitoring a parameter of a hostile environment within the interior of a sealed chamber, the chamber having a wall and an access port extending through the wall to the chamber exterior, the monitoring system comprising:

a flexible, generally tubular, elongated, hermetically sealed housing having a distal end, a proximal end and an interior,

the housing being made of a non-porous, corrosive resistant material,

the distal end of the housing including a sealed window and a sensor for sensing a parameter of the hostile environment through the window,

the proximal end of the housing being rigidly secured to the chamber wall at the access port to form a hermetic seal between the proximal end of the housing and the chamber,

the interior of the housing being accessible through the access port,

the interior of the housing including a transmission media for transmitting an output signal of the sensor from the distal end of the housing to the proximal end of the housing and through the access port; and

an apparatus located outside of the chamber and connected to the transmission media for receiving and processing the sensor signal and displaying a representation of the sensor signal.

Claim 24. (Previously presented). The optical monitoring system as recited in claim 23, wherein the sensor is selected from the group consisting of a temperature sensor, a pressure sensor, an oxygen sensor and a spectra graphic chemical analysis sensor.

Claim 25. (Previously presented). The optical monitoring system as recited in claim 23, wherein the housing comprises a flexible sheath formed of a stainless steel bellows.

Claim 26. (Previously presented). The optical monitoring system as recited in claim 23, wherein the housing comprises a flexible polymeric tube.

Claim 27. (Previously presented). The optical monitoring system as recited in claim 23, wherein the window is formed from a material selected from the group consisting of synthetic sapphire, glass, quartz and a polymeric material.

Claim 28. (Previously presented). The optical monitoring system as recited in claim 23, wherein the housing further includes a sealed window secured to the distal end of the housing by a method selected from the group consisting of brazing, fusion and an adhesive.

Claim 29. (Previously presented). The optical monitoring system as recited in claim 23, wherein the interior of the housing is provided with a fluid under pressure to control the environment within the interior of the housing.

Claim 30. (Previously presented). An optical monitoring system for transmitting images from within the interior of a sealed chamber to the chamber exterior, the chamber having a wall and an access port extending through the wall, the monitoring system comprising:

a generally tubular, elongated, hermetically sealed housing having a distal end, a proximal end and an interior,

the housing being made of a non-porous material,

the distal end of the housing including a sealed window,

the proximal end of the housing being rigidly secured to the chamber wall at the access port to form a hermetic seal between the proximal end of the housing and the chamber,

the interior of the housing being accessible through the access port,

the interior of the housing including a transmission media for transmitting images of the interior of the chamber obtained through the window from the distal end of the housing to the proximal end of the housing and through the access port; and

a monitor located outside of the chamber and connected to the transmission media for receiving the images of the interior of the chamber.

Claim 31. (Previously presented). A monitoring system for monitoring a parameter within the interior of a sealed chamber, the chamber having a wall and an access port extending through the wall to the chamber exterior, the monitoring system comprising:

a generally tubular, elongated hermetically sealed housing having a distal end, a proximal end and an interior,

the housing being made of a non-porous material,

the distal end of the housing including a sealed window and a sensor for sensing a parameter of the hostile environment through the window,

the proximal end of the housing being rigidly secured to the chamber wall at the access port to form a hermetic seal between the proximal end of the housing and the chamber,

the interior of the housing being accessible through the access port,

the interior of the housing including a transmission media for transmitting an output signal of the sensor from the distal end of the housing to the proximal end of the housing and through the access port; and

an apparatus located outside of the chamber and connected to the transmission media for receiving and processing the sensor signal.

IX. EVIDENCE APPENDIX

None.

X. RELATED PROCEEDINGS APPENDIX

None.